

Serial No. 10/087,915
January 20, 2004
Reply to the Office Action dated October 28, 2003
Page 2 of 10

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (canceled).

Claim 2 (previously presented): A method of producing a high frequency circuit chip according to claim 5, wherein the conductor layer is formed by applying and firing electrically conductive paste.

Claim 3 (previously presented): A method of producing a high frequency circuit chip according to claim 5, further comprising the steps of:

forming a protection film so as to cover the wiring pattern on the substrate, and cutting the substrate along desired dicing lines to obtain the high frequency circuit chip.

Claim 4 (previously presented): A method of producing a high frequency circuit chip according to claim 5, further comprising a step of forming a thin-film resistor pattern which is connected to the wiring pattern.

Claim 5 (previously presented): A method of producing a high frequency circuit chip having a substrate made of a ceramic with a high dielectric constant, a wiring pattern provided on one main surface of the substrate, an electric conductor layer provided on substantially all of another main surface of the substrate, and a through-hole including a connecting electrode for connecting the wiring pattern and the conductor layer to each other, the method comprising the steps of:

Serial No. 10/087,915
January 20, 2004
Reply to the Office Action dated October 28, 2003
Page 3 of 10

filling electrically conductive paste into a perforation in the substrate, and firing the paste to form the connecting electrode of the through-hole;

forming a resist pattern with an opening having a desired shape and size directly on the substrate;

forming a thin film with a wiring material directly on the substrate through the opening over the resist pattern after forming the resist pattern;

removing the unnecessary wiring material thin film deposited on the resist pattern together with the resist pattern to form the wiring pattern directly on the substrate by a lift-off method;

mirror-polishing at least the surface of the fired substrate on which the wiring pattern is formed, and the fired substrate in which the through-hole having the connecting electrode is formed; and

thereafter forming the wiring pattern on the mirror-polished surface by the lift-off method.

Claim 6 (previously presented): A method of producing a high frequency circuit chip according to claim 5, wherein the substrate has a relative dielectric constant of at least about 10.

Claim 7 (previously presented): A method of producing a high frequency circuit chip according to claim 5, includes the step of forming the wiring pattern formed on at least one main surface of the substrate and the electric conductor layer formed on substantially all of the other main surface by a conductor pattern containing at least one metal selected from the group consisting of Ag, Cu, and Al as a major component and having a thickness of at least about 2 μm .

Claim 8 (previously presented): A method of producing a high frequency circuit chip according to claim 5, wherein the connecting electrode of the through-hole is

Serial No. 10/087,915
January 20, 2004
Reply to the Office Action dated October 28, 2003
Page 4 of 10

formed by electrically conductive paste including at least one metal selected from the group consisting of Ag, Cu, and Al as a major component.

Claim 9 (canceled).

Claim 10 (previously presented): A method of producing a high frequency circuit chip having a substrate made of a ceramic having a high dielectric constant, a wiring pattern disposed on each of front and back main surfaces of the substrate, and a through-hole including a connecting electrode for connecting the wiring patterns disposed on the front and back main surfaces of the substrate, the method comprising the steps of:

filling electrically conductive paste into a perforation in the substrate, and firing the paste to form the connecting electrode of the through-hole;

forming a resist pattern with an opening having a predetermined shape and size directly on the substrate;

forming a thin film with a wiring material directly on the substrate through the opening over the resist pattern after forming the resist pattern;

removing the unnecessary wiring material thin film deposited on the resist pattern together with the resist pattern to form each wiring pattern directly on the substrate by the lift-off method;

mirror-polishing at least the surface of the fired substrate on which the wiring pattern is formed, and the fired substrate in which the through-hole having the connecting electrode is formed; and

thereafter forming the wiring pattern on the mirror-polished surface by the lift-off method.

Claim 11 (canceled).

Serial No. 10/087,915
January 20, 2004
Reply to the Office Action dated October 28, 2003
Page 5 of 10

Claim 12 (original): A method of producing a high frequency circuit chip according to claim 10, further comprising the step of forming the wiring patterns formed on both of the front and back main surfaces of the substrate by forming a conductor pattern including at least one metal selected from the group consisting of Ag, Cu, and Al as a major component and having a thickness of at least about 2 μm .

Claims 13-17 (canceled).

Claim 18 (new): A method of producing a high frequency circuit chip according to claim 5, wherein the thin film includes an adhesion layer.

Claim 19 (new): A method of producing a high frequency circuit chip according to claim 5, wherein the thin film includes a wire bonding layer.

Claim 20 (new): A method of producing a high frequency circuit chip according to claim 5, wherein the thin film includes a buffer layer.

Claim 21 (new): A method of producing a high frequency circuit chip according to claim 5, further comprising the step of dipping the substrate into a rust inhibiting agent.

Claim 22 (new): A method of producing a high frequency circuit chip according to claim 5, wherein the thin film includes an adhesion layer formed on the substrate, a major conductor layer formed on the adhesion layer, a buffer layer formed on the major conductor layer, and a wire bonding layer formed on the buffer layer.

Claim 23 (new): A method of producing a high frequency circuit chip according to claim 10, wherein the thin film includes an adhesion layer.

Serial No. 10/087,915
January 20, 2004
Reply to the Office Action dated October 28, 2003
Page 6 of 10

Claim 24 (new): A method of producing a high frequency circuit chip according to claim 10, wherein the thin film includes a wire bonding layer.

Claim 25 (new): A method of producing a high frequency circuit chip according to claim 10, wherein the thin film includes a buffer layer.

Claim 26 (new): A method of producing a high frequency circuit chip according to claim 10, further comprising the step of dipping the substrate into a rust inhibiting agent.

Claim 27 (new): A method of producing a high frequency circuit chip according to claim 10, wherein the thin film includes an adhesion layer formed on the substrate, a major conductor layer formed on the adhesion layer, a buffer layer formed on the major conductor layer, and a wire bonding layer formed on the buffer layer.